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Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 April 2004*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-86* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-86* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1.   A request for continued examination under 37 CFR 1.114, including the fee set

forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this

application is eligible for continued examination under 37 CFR 1.114, and the fee set

forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action

has been withdrawn pursuant to 37 CFR 1.114.

2.   Applicant's submission filed on April 28, 2004 has been entered. Claims 1-18, 27-

28, 42, 48, 55-63, 65-66, 68-70, and 81 have been amended.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form

the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed
> publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. **Claims 1-14, 18-24, 27-36, 39-40, 42-67, and 72-86 are rejected** under 35

U.S.C. 102(a) as being anticipated by Lowe-Norris ("Windows 2000 Active Directory"),

hereinafter referred to as "Norris"

As per claim 1, Norris teaches a network system, comprising:

- "a first computer configured to maintain an object having an attribute at page 68,

    Fig. 4-1, ("Server A");

- "the attribute comprised of individual linked values" at Fig. 4-1;

- "each having conflict-resolution data" at Fig. 4-1, ("Version number" and "Timestamp");

- "a second computer configured to replicate the object to generate a replica object and maintain the replica object " at Fig. 4-1, ("Server B");

- "the second computer further configured to resolve a replication conflict between a linked value of the attribute in the object and the linked value of the attribute in the replica object" at page 77;

- "the replication conflict being resolved with the conflict-resolution data associated with the linked value" at page 77, 3rd paragraph.

As per claim 2, Norris teaches a network system as recited in claim 1, wherein "the second computer is further configured to compare the conflict-resolution data associated with the linked value of the attribute in the object and the conflict-resolution data associated with the linked value of the attribute in the replica object to resolve the replication conflict" at page 77, 3rd paragraph.

As per claim 3, Norris teaches a network system as recited in claim 1, wherein "the conflict-resolution data comprises a version indicator that corresponds to a version of an individual linked value" at page 68, Fig. 4-1.

As per claim 4, Norris teaches a network system as recited in claim 1, wherein:

- "the conflict-resolution data comprises a version number that corresponds to a version of an individual linked value" at page 68, Fig. 4-1;

- "and wherein the second computer is further configured to: compare the version number associated with the linked value of the attribute in the object and the version number associated with the linked value of the attribute in the replica object to resolve the replication conflict" at page 77, 3rd paragraph;

- "and update the linked value of the attribute in the replica object if the value has a lower version number than the linked value of the attribute in the object" page 77, 3rd paragraph.

As per claim 5, Norris teaches a network system as recited in claim 1, wherein "the conflict-resolution data comprises an update indicator that corresponds to when an individual linked value is updated" at page 68, Fig. 4-1, ("USN, Update Sequence Number").

As per claim 6, Norris teaches a network system as recited in claim 1, wherein:

- "the conflict-resolution data comprises an update timestamp that corresponds to when an individual linked value is updated" at page 68, Fig. 4-1;

- "and wherein the second computer is further configured to: compare the update timestamp associated with the linked value of the attribute in the object and the update timestamp associated with the linked value of the attribute in the replica object to resolve the replication conflict" at page 77, 3rd paragraph;

- "and update the linked value of the attribute in the replica object if the value has an earlier update timestamp than the linked value of the attribute in the object" at page 77, 3rd paragraph.

As per claim 7, Norris teaches a network system as recited in claim 1, wherein "the conflict-resolution data comprises a creation indicator that corresponds to when an individual linked value is created" at page 68, Fig. 4-1.

As per claim 8, Norris teaches a network system as recited in claim 1, wherein

- "the conflict-resolution data comprises a creation timestamp that corresponds to when an individual linked value is created" at page 68, Fig. 4-1;

- "and wherein the second computer is further configured to: compare the creation timestamp associated with the linked value of the attribute in the object and the creation timestamp associated with the linked value of the attribute in the replica object to resolve the replication conflict" at page 77, 3rd paragraph;

- "and update the linked value of the attribute in the replica object if the linked value has an earlier creation timestamp than the linked value of the attribute in the object" at page 77, 3rd paragraph.

As per claim 9, Norris teaches a network system as recited in claim 1, wherein "the conflict-resolution data comprises a version indicator that corresponds to a version of an individual linked value and an update indicator that corresponds to when the individual linked value is updated" at page 68, Fig. 4-1.

As per claim 10, Norris teaches a network system as recited in claim 1, wherein:

- "the conflict-resolution data comprises a version number that corresponds to a version of an individual linked value and an update timestamp that corresponds to when the individual linked value is updated" at page 68, Fig. 4-1;

- "and wherein the second computer is further configured to: compare the conflict-resolution data associated with the linked value of the attribute in the object and the conflict-resolution data associated with the linked value of the attribute in the replica object" at page 77, 3rd paragraph;

- "and resolve the replication conflict in favor of the linked value that first has a higher version number, and second has a later update timestamp" at page 77, 3rd paragraph.

As per claim 11, Norris teaches a network system as recited in claim 1, wherein:

- "the conflict-resolution data comprises a version number that corresponds to a version of an individual linked value and an update timestamp that corresponds to when the individual linked value is updated" at page 68, Fig. 4-1 ;

- "and wherein the second computer is further configured to: compare the conflict-resolution data associated with the linked value of the attribute in the object and the conflict-resolution data associated with the linked value of the attribute in the replica object to resolve the replication conflict" at page 77 ;

- "update the linked value of the attribute in the replica object if the linked value has a lower version number than the linked value of the attribute in the object, and if the version number associated with the linked value of the attribute in the replica object is equivalent to the version number associated with the linked value of the attribute in the object, update the linked value of the attribute in the replica object if the linked value has an earlier update timestamp than the linked value of the attribute in the object" at page 77, 3rd paragraph.

As per claim 12, Norris teaches a network system as recited in claim 1, wherein "the conflict-resolution data comprises a creation indicator that corresponds to when an individual linked value is created, a version indicator that corresponds to a version of the individual linked value, and an update indicator that corresponds to when the individual linked value is updated" at page 68, Fig. 4-1.

As per claim 13, Norris teaches a network system as recited in claim 1, wherein:

- "the conflict-resolution data comprises a creation timestamp that corresponds to when an individual linked value is created, a version number that corresponds to a version of the individual linked value, and an update timestamp that corresponds to when the individual linked value is updated" at page 68, Fig. 4-1;

- "and wherein the second computer is further configured to: compare the conflict-resolution data associated with the linked value of the attribute in the object and the conflict-resolution data associated with the linked value of the attribute in the replica object; and resolve the replication conflict in favor of the linked value that

first has a later creation timestamp, second has a higher version number, and third has a later update timestamp" at page 77.

As per claim 14, Norris teaches a network system as recited in claim 1, wherein:

- "the conflict-resolution data comprises a creation timestamp that corresponds to when an individual value is created, a version number that corresponds to a version of the individual value, and an update timestamp that corresponds to when the individual linked value is updated" at page 68, Fig. 4-1;

- "and wherein the second computer is further configured to: compare the conflict-resolution data associated with the linked value of the attribute in the object and the conflict-resolution data associated with the linked value of the attribute in the replica object to resolve the replication conflict" at page 77;

- "update the linked value of the attribute in the replica object if the value has an earlier creation timestamp than the value of the attribute in the object; if the creation timestamp associated with the linked value of the attribute in the replica object is equivalent to the creation timestamp associated with the linked value of the attribute in the object, update the linked value of the attribute in the replica object if the linked value has a lower version number than the linked value of the attribute in the object" at page 77;

- "and if the version number associated with the linked value of the attribute in the replica object is equivalent to the version number associated with the linked

value of the attribute in the object, update the linked value of the attribute in the replica object if the value has an earlier update timestamp than the value of the attribute in the object" at page 77, 3rd paragraph.

As per claim 18, Norris teaches a state-based replication system, comprising:

- "an object having an attribute comprised of linked values, individual linked values having indicators to indicate a change to a linked value of the attribute" at page 68, Fig. 4-1.

- "a computing device configured to replicate the object and identify a change to a linked value of the attribute by one or more indicators associated with the linked value" at page 68, Fig. 4-1.

As per claim 19, Norris teaches a state-based replication system as recited in claim 18, wherein

- "the computing device is further configured to: maintain a replica object, the replica object being replicated from the object" at page 68, Fig. 4-1;

- "and compare the object with the replica object to identify, with the indicators, a linked value replication conflict" at page 77.

As per claim 20, Norris teaches a state-based replication system as recited in claim 18, wherein "the indicators comprise a version indicator that corresponds to a version of a linked value" at page 68, Fig. 4-1.

As per claim 21, Norris teaches a state-based replication system as recited in claim 18, wherein "the indicators comprise an update indicator that corresponds to when a linked value is changed" at page 68, Fig. 4-1.

As per claim 22, Norris teaches a state-based replication system as recited in claim 18, wherein "the indicators comprise a creation indicator that corresponds to when a linked value is created" page 68, Fig. 4-1.

As per claim 23, Norris teaches a state-based replication system as recited in claim 18, wherein "the indicators comprise a version number that corresponds to a version of a linked value and an update timestamp that corresponds to when the linked value is changed" at page 68, Fig. 4-1.

As per claim 24, Norris teaches a state-based replication system as recited in claim 18, wherein "the indicators comprise a creation timestamp that corresponds to when a linked value is created, a version number that corresponds to a version of the linked value, and an update timestamp that corresponds to when the linked value is changed" at page 68, Fig. 4-1.

As per claim 27, Norris teaches a state-based replication system, comprising:

- "a first computer configured to maintain a first data structure, the first data structure having a multi-valued attribute comprised of multiple linked values" at page 68, Fig. 4-1, ("Server A").

- "individual linked values having conflict-resolution information to indicate a

  change to a linked value of the attribute" at page 68, Fig. 4-1;

- "a second computer configured to maintain a second data structure having the

  multi-valued attribute comprised of the linked values" at page 68, Fig. 4-1,

  ("Server B");

- "and the first and second data structures configured to be replicated and to have

  a replication conflict between a linked value of the attribute in the first data

  structure and a linked value of the attribute in the second data structure resolved

  with the conflict-resolution information associated with the linked values" at

  pages 68 and 77.

As per claim 28, Norris teaches a state-based replication system as recited in

claim 27, wherein:

- "the first and second computers are further configured to: compare the conflict-

  resolution information associated with the linked value of the attribute in the first

  data structure with the conflict-resolution information associated with the linked

  value of the attribute in the second data structure; identify a replication conflict;

  and resolve the replication conflict with the conflict-resolution information

  associated with the linked values" at page 77.

As per claim 29, Norris teaches a state-based replication system as recited in claim 27, wherein "the conflict-resolution information comprises a version indicator that corresponds to a version of an individual linked value" at page 68, Fig. 4-1.

As per claim 30, Norris teaches a state-based replication system as recited in claim 27, wherein:

- "the conflict-resolution information comprises a version number that corresponds to a version of an individual linked value" at page 68, Fig. 4-1;

- "the first and second computers are further configured to compare the version number associated with the linked value of the attribute in the first data structure with the version number associated with the linked value of the attribute in the second data structure" at page 77;

- "the first computer is further configured to update the linked value of the attribute in the first data structure if the linked value has a lower version number than the linked value of the attribute in the second data structure; and the second computer is further configured to update the linked value of the attribute in the second data structure if the linked value has a lower version number than the linked value of the attribute in the first data structure" at page 77, 3rd paragraph.

As per claim 31, Norris teaches a state-based replication system as recited in claim 27, wherein "the conflict-resolution information comprises an update indicator that corresponds to when an individual linked value is changed" at page 68, Fig. 4-1;

As per claim 32, Norris teaches a state-based replication system as recited in claim 27, wherein:

- "the conflict-resolution information comprises an update timestamp that corresponds to when an individual linked value is changed" at page 68, Fig. 4-1;

- "the first and second computers are further configured to compare the update timestamp associated with the linked value of the attribute in the first data structure with the update timestamp associated with the linked value of the attribute in the second data structure; the first computer is further configured to update the linked value of the attribute in the first data structure if the linked value has an earlier update timestamp than the linked value of the attribute in the second data structure; and the second computer is further configured to update the linked value of the attribute in the second data structure if the linked value has an earlier update timestamp than the linked value of the attribute in the first data structure" at page 77, 3rd paragraph.

As per claim 33, Norris teaches a state-based replication system as recited in claim 27, wherein "the conflict-resolution information comprises a creation indicator that corresponds to when an individual linked value is created" at page 68, last paragraph.

As per claim 34, Norris teaches a state-based replication system as recited in claim 27, wherein:

- "the conflict-resolution information comprises a creation timestamp that corresponds to when an individual linked value is created" at page 68, Fig. 4-1;

- "the first and second computers are further configured to compare the creation timestamp associated with the linked value of the attribute in the first data structure with the creation timestamp associated with the linked value of the attribute in the second data structure" at page 77, 3rd paragraph;

- "the first computer is further configured to update the linked value of the attribute in the first data structure if the linked value has an earlier creation timestamp than the linked value of the attribute in the second data structure; and the second computer is further configured to update the linked value of the attribute in the second data structure if the linked value has an earlier creation timestamp than the linked value of the attribute in the first data structure" at page 77.

As per claim 35, Norris teaches a state-based replication system as recited in claim 27, wherein:

- "the conflict-resolution information comprises a version indicator that corresponds to a version of an individual linked value" at page 68, Fig. 4-1;

- "and an update indicator that corresponds to when the individual linked value is changed" at page 68, last paragraph.

As per claim 36, Norris teaches a state-based replication system as recited in claim 27, wherein:

- "the conflict-resolution information comprises a creation indicator that corresponds to when an individual linked value is created" at page 68, last paragraph;

- "a version indicator that corresponds to a version of the individual linked value" at page 68, Fig. 4-1;

- "and an update indicator that corresponds to when the individual linked value is changed" at page 68, Fig. 4-1.

As per claim 39, Norris teaches a computer-readable medium having stored thereon a data structure, comprising:

- "a first data field containing an attribute" at page 68, Fig. 4-1;

- "a second data field containing a linked value of the attribute contained in the first data field" at page 68, Fig. 4-1;

- "a third data field containing a version indicator corresponding to a version of the linked value contained in the second data field" at page 68, Fig. 4-1;

- "and a fourth data field containing an update indicator corresponding to when the version indicator contained in the third data field is changed" at page 68, Fig. 4-1.

As per claim 40, Norris teaches a computer-readable medium as recited in claim 39, wherein "the data structure further comprises a fifth data field containing a creation

indicator corresponding to when the linked value contained in the second data field is created" at page 68, Fig. 4-1.

As per claim 42, Norris teaches a network system, comprising:

- "a first computer configured to replicate objects at an attribute level, and further configured to maintain an object having a multi-valued attribute, the multi-valued attribute comprised of multiple linked values" at page 68, Fig. 4-1;

- "a second computer configured to replicate objects at an attribute value level, and further configured to maintain a second object, the second object having a multi-valued attribute comprised of multiple linked values, the multiple linked values configured to have conflict-resolution data" at page 68, Fig. 4-1;

- "the first computer further configured to: replicate the second object from the second computer" at page 68, Fig. 4-1; and

- "resolve a replication conflict between the object and the second object at the attribute value level with the conflict-resolution data associated with a linked value" at page 77.

As per claim 43, Norris teaches a network system as recited in claim 42, wherein "the first computer first resolves the replication conflict between the object and the second object at the attribute level, and second resolves the replication conflict between the object and the second object at the attribute value level" at page 77.

As per claim 44, Norris teaches a network system as recited in claim 42, wherein "the first computer does not replicate a value from the second object if the value does not have conflict-resolution data" at page 69, step 2.

As per claim 45, Norris teaches a network system as recited in claim 42, wherein "the first computer does not replicate a value from the second object if the value has null conflict-resolution data" at page 69, step 2.

As per claim 46, Norris teaches a network system as recited in claim 42, wherein "the first computer resolves the replication conflict between the object and the second object at the attribute value level in favor of a value that has conflict-resolution data" at page 77.

As per claim 47, Norris teaches a network system as recited in claim 42, wherein "the first computer resolves the replication conflict between the object and the second object at the attribute value level in favor of a value that has non-null conflict-resolution data" at page 77.

As per claim 48, Norris teaches a network system as recited in claim 42, wherein

- "the second computer is further configured to: replicate the object from the first computer" at page 68, Fig. 4-1; and

- "resolve a replication conflict between the object and the second object at the attribute value level with the conflict-resolution data" at page 77.

As per claim 49, Norris teaches a network system as recited in claim 48, wherein "the second computer first resolves the replication conflict between the object and the second object at the attribute level, and second resolves the replication conflict between the object and the second object at the attribute value level" at page 77.

As per claim 50, Norris teaches a network system as recited in claim 48, wherein "the second computer does not replicate a value from the object if the value does not have conflict-resolution data" at page 69, step 2.

As per claim 51, Norris teaches a network system as recited in claim 48, wherein "the second computer does not replicate a value from the object if the value has null conflict-resolution data" at page 69, step 2.

As per claim 52, Norris teaches a network system as recited in claim 48, wherein "the second computer resolves the replication conflict between the object and the second object at the attribute value level in favor of a value that has conflict-resolution data" at page 77.

As per claim 53, Norris teaches a network system as recited in claim 48, wherein "the second computer resolves the replication conflict between the object and the second object at the attribute value level in favor of a value that has non-null conflict-resolution data" at page 77.

As per claim 54, Norris teaches a network system as recited in claim 48, wherein "the second computer is further configured to delete a value from the second

object if the value does not have conflict resolution data, and if the value is not replicated from the object" at page 77, 1st paragraph.

As per claims 55, 72, Norris teaches a method and a computer readable medium performing the method comprising:

- "replicating an object stored in a first directory with a replica object stored in a second directory, the object and the replica object each having an attribute comprised of multiple linked values, the multiple linked values each having conflict-resolution data" at page 68, Fig. 4-1;

- "comparing an individual linked value of the attribute in the object with an individual linked value of the attribute in the replica object to identify a replication conflict" at page 77;

- "and resolving the replication conflict with the conflict-resolution data associated with the individual linked values" at page 77, 3rd paragraph.

As per claim 56, Norris teaches a method as recited in claim 55, wherein "the conflict-resolution data comprises a version number that corresponds to a version of an individual linked value" at page 68, Fig. 4-1, and wherein "said comparing comprises determining if an individual linked value version number has been changed" at page 77, 3rd paragraph.

As per claim 57, Norris teaches a method as recited in claim 55, wherein

- "the conflict-resolution data comprises a version number that corresponds to a version of an individual linked value, said comparing comprises determining if an individual linked value version number has been changed" at page 68, Fig. 4-1 and page 77, 3rd paragraph;

- "the method further comprises updating the individual linked value of the attribute that has a lower version number with the individual linked value of the attribute that has a higher version number" at page 77, 3rd paragraph.

As per claim 58, Norris teaches a method as recited in claim 55, wherein "the conflict-resolution data comprises an update timestamp that corresponds to when an individual linked value is changed" at page 68, Fig. 4-1, and wherein "said comparing comprises determining if an individual linked value update timestamp has been changed" at page 77.

As per claim 59, Norris teaches a method as recited in claim 55, wherein "the conflict-resolution data comprises an update timestamp that corresponds to when an individual linked value is changed" at page 68, Fig. 4-1, "said comparing comprises determining if an individual linked value update timestamp has been changed, and the method further comprises updating the individual linked value of the attribute that has an earlier update timestamp with the individual linked value of the attribute that has a later update timestamp" at page 77, 3rd paragraph.

As per claim 60, Norris teaches a method as recited in claim 55, wherein "the conflict-resolution data comprises a creation timestamp that corresponds to when an

individual linked value is created, and wherein said comparing comprises determining if a creation timestamp has been changed" at page 68, Fig. 4-1 and page 77, 3rd paragraph.

As per claim 61, Norris teaches a method as recited in claim 55, wherein "the conflict-resolution data comprises a creation timestamp that corresponds to when an individual linked value is created, said comparing comprises determining if a creation timestamp has been changed, and the method further comprises updating the individual linked value of the attribute that has an earlier creation timestamp with the individual linked value of the attribute that has a later creation timestamp" at page 68, Fig. 4-1 and page 77.

As per claim 62, Norris teaches a method as recited in claim 55, wherein "the conflict-resolution data comprises a version number that corresponds to a version of an individual linked value and an update timestamp that corresponds to when the individual linked value is changed, and wherein said comparing comprises determining if an individual linked value version number has been changed and if the individual linked value update timestamp has been changed" at page 68, Fig. 4-1 and page 77.

As per claims 63, 64, teaches a method and computer readable medium as recited in claim 55, wherein

- "the conflict-resolution data comprises a version number that corresponds to a version of an individual linked value and an update timestamp that corresponds to when the individual linked value is changed" at page 68, Fig. 4-1;

- "and the method further comprises updating the individual linked value of the attribute that first has a lower version number, and second has an earlier update timestamp" at page 77, 3rd paragraph.

As per claim 65, Norris teaches a method as recited in claim 55, wherein

- "the conflict-resolution data comprises a creation timestamp that corresponds to when an individual linked value is created, a version number that corresponds to a version of the individual linked value, and an update timestamp that corresponds to when the individual linked value is changed" at page 68;

- "and wherein said comparing comprises determining if an individual linked value creation timestamp has been changed, if the individual linked value version number has been changed, and if the individual linked value update timestamp has been changed" at page 77.

As per claims 66-67, Norris teaches a method as recited in claim 55, wherein "the conflict-resolution data comprises a creation timestamp that corresponds to when an individual linked value is created, a version number that corresponds to a version of the individual linked value, and an update timestamp that corresponds to when the individual linked value is changed" at page 68; and the method further comprises "updating the individual linked value of the attribute that first has an earlier creation timestamp, second has a lower version number, and third has an earlier update timestamp" at page 77, 3rd paragraph.

As per claims 73, 80, Norris teaches a method and a computer readable

medium performing the method of replicating a linked value of a multi-valued attribute

contained in an object comprising:

"comparing the conflict-resolution information associated with the linked value in the

object with the conflict-resolution information associated with the linked value in the

replica object; identifying a replication conflict with the conflict-resolution information;

and resolving the replication conflict with the conflict-resolution information" at page 77.

As per claim 74, Norris teaches a method as recited in claim 73, wherein "the

conflict-resolution information comprises a version number that corresponds to a

version of the linked value, and the method further comprising: determining if the linked

value version number has been changed; and updating the linked value of the attribute

that has a lower version number with the linked value of the attribute that has a higher

version number" at page 77, 3rd paragraph.

As per claim 75, Norris teaches a method as recited in claim 73, wherein "the

conflict-resolution information comprises an update timestamp that corresponds to when

the linked value is changed, and the method further comprising: determining if the linked

value update timestamp has been changed; and updating the linked value of the

attribute that has an earlier update timestamp with the linked value of the attribute that

has a later update timestamp" at page 77, 3rd paragraph.

As per claim 76, Norris teaches a method as recited in claim 73, wherein "the

conflict-resolution information comprises a creation timestamp that corresponds to when

the linked value is created" at page 68, and "the method further comprising: determining if the linked value creation timestamp has been changed; and updating the linked value of the attribute that has an earlier creation timestamp with the linked value of the attribute that has a later creation timestamp" at page 77.

As per claim 77, Norris teaches a method as recited in claim 73, wherein "the conflict-resolution information comprises a creation timestamp that corresponds to when the linked value is created, a version number that corresponds to a version of the linked value, and an update timestamp that corresponds to when the linked value is changed" at page 68, Fig. 4-1.

As per claims 78-79, Norris teaches a method and a computer readable medium performing the method as recited in claim 73, wherein "the conflict-resolution information comprises a creation timestamp that corresponds to when the linked value is created, a version number that corresponds to a version of the linked value, and an update timestamp that corresponds to when the linked value is changed" at page 68, and the method further comprises "updating the linked value of the attribute if the linked value first has an earlier creation timestamp, second has a lower version number, and third has an earlier update timestamp" at page 77, 3rd paragraph.

As per claims 81, 86, Norris teaches a method and a computer readable medium performing the method, comprising:

- "replicating a first object with a second object, the first object having an attribute comprised of multiple linked values" at page 68, Fig. 4-1;

- "the second object having an attribute comprised of multiple linked values configured to have associated conflict-resolution data" at page 68, Fig. 4-1;

- "resolving first a replication conflict between the first object and the second object at an attribute level; and resolving second, with the conflict-resolution data, a replication conflict between the first object and the second object at an attribute value level" at page 77.

As per claim 82, Norris teaches a method as recited in claim 81, further comprising "determining whether a value corresponding to the second object has conflict-resolution data and said replicating the linked value if said determining that the linked value has conflict-resolution data" at page 69, step 2.

As per claim 83, Norris teaches a method as recited in claim 81, "further comprising determining whether a linked value corresponding to the second object has non-null conflict-resolution data and said replicating the linked value if said determining that the value has non-null conflict-resolution data" at Col. 8 lines 13-67 and Col. 33 lines 30 to Col. 34 line 20.

As per claim 84, Norris teaches a method as recited in claim 81, "said resolving the replication conflict between the first object and the second object at the attribute value level in favor of a linked value that has conflict-resolution data" at page 77.

As per claim 85, Norris teaches a method as recited in claim 81, further comprising "deleting a linked value corresponding to the second object if the value does

not have conflict-resolution data and if the value is not replicated" at page 77, 1st

paragraph.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claims 15-17, 25-26, 37-38, 41, 68-71 are rejected** under 35 U.S.C. 103(a) as

being unpatentable over Norris as applied to claims **1-14, 18-24, 27-36, 39-40, 42-67,**

and 72-86 above, and in view of Bodnar et al. (US 6,295,541 B1)

As per claim 15, Norris teaches a network system as recited in claim 1 above.

Norris does not teach: "the individual values have an associated deletion indicator that

is a null identifier to indicate the existence of a value of the attribute in the object".

However, Bodnar teaches a similar method for synchronizing replica objects including

"the individual values have an associated deletion indicator that is a null identifier to

indicate the existence of a value of the attribute in the object" at Col. 39 line 45 to Col.

40 line 10 and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in

the art at the time of the invention to modify Norris to associate a deletion indicator with

each record as taught by Bodnar to indicate whether a record has been deleted, so that

the replica object could be updated accordingly to reflect the changes and maintain the

consistency between the object and the replica object.

As per claim 16, Norris teaches a network system as recited in claim 1. Norris

does not teach: "the individual values have an associated deletion indicator that

corresponds to when an individual value is marked for deletion from the attribute in the

object". However, Bodnar teaches a similar method for synchronizing replica objects

including "the individual values have an associated deletion indicator that corresponds

to when an individual values is marked for deletion from the attribute in the object" at

Col. 39 line 45 to Col. 40 line 10 and Fig. 10B. Thus, it would have been obvious to

those of ordinary skill in the art at the time of the invention to modify Norris to associate

a deletion indicator with an individual value as taught by Bodnar to indicate whether an

individual value has been deleted, so that the replica object could be updated

accordingly to reflect the changes and maintain the consistency between the object and

the replica object.

As per claim 17, Norris teaches a network system as recited in claim 1. Norris

does not teach: "the individual values have an associated deletion timestamp that

corresponds to when an individual value is marked for deletion from the attribute in the

object; and wherein the second computer is further configured to delete a value from the

attribute in the object if the value has a deletion timestamp that indicates the value is

marked for deletion". However, Bodnar teaches a similar method for synchronizing

replica objects including: "the individual values have an associated deletion timestamp

that corresponds to when an individual value is marked for deletion from the attribute in

the object; and wherein the second computer is further configured to delete a value from

the attribute in the object if the value has a deletion timestamp that indicates the value is

marked for deletion" at Col. 39 line 45 to Col. 40 line 10, Col. 50 lines 63-67, and Fig.

10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of

the invention to modify Norris to associate a deletion timestamp with an individual value

as taught by Bodnar to indicate the time an individual value has been deleted, so that

the replica object could be updated accordingly to reflect the changes and maintain the

consistency between the object and the replica object.

As per claim 25, Norris teaches a state-based replication system as recited in

claim 18. Norris does not teach: "the indicators comprise a deletion indicator that has a

null identifier to indicate the existence of a linked value of the attribute". However,

Bodnar teaches a similar method including "the indicators comprise a deletion indicator

that has a null identifier to indicate the existence of a linked value of the attribute" at Col.

39 line 45 to Col. 40 line 10 and Fig. 10B. Thus, it would have been obvious to those of

ordinary skill in the art at the time of the invention to modify Norris to associate a

deletion indicator with each record as taught by Bodnar to indicate whether a record has

been deleted, in order to make it easier to replicate the change to its replica object.

As per claim 26, Norris teaches a state-based replication system as recited in

claim 18. Norris does not teach: "the indicators comprise a deletion timestamp that

corresponds to when a linked value is marked for deletion from the attribute" However, Bodnar teaches a similar method including: "the indicators comprise a deletion timestamp that corresponds to when a linked value is marked for deletion from the attribute" at Col. 39 line 45 to Col. 40 line 10, Col. 50 lines 63-67, and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Norris to associate a deletion timestamp with an individual value as taught by Bodnar to indicate the time an individual value has been deleted, so that the replica object could be updated accordingly to reflect the changes and maintain the consistency between the object and the replica object.

As per claim 37, Norris teaches a state-based replication system as recited in claim 27. Norris does not teach: "the individual linked values have an associated deletion indicator that is a null identifier to indicate the existence of a linked value of the multi-valued attribute". However, Bodnar teaches a similar method including "the individual values have an associated deletion indicator that is a null identifier to indicate the existence of a linked value" at Col. 39 line 45 to Col. 40 line 10 and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Norris to associate a deletion indicator with each record as taught by Bodnar to indicate whether a record has been deleted, so that the replica object could be updated accordingly to reflect the changes and maintain the consistency between the object and the replica object.

As per claim 38, Norris teaches a state-based replication system as recited in claim 27. Norris does not teach: "the individual linked values have an associated

deletion indicator that corresponds to when an individual linked value is marked for deletion from the multi-valued attribute". However, Bodnar teaches a similar method including "the individual linked values have an associated deletion indicator that corresponds to when an individual linked value is marked for deletion from the multi-valued attribute" at Col. 39 line 45 to Col. 40 line 10 and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Norris to associate a deletion indicator with each record as taught by Bodnar to indicate whether a record has been deleted, so that the replica object could be updated accordingly to reflect the changes and maintain the consistency between the object and the replica object.

As per claim 41, Norris teaches a computer-readable medium as recited in claim 39. Norris does not teach: "the data structure further comprises a sixth data field containing a deletion indicator corresponding to the linked value contained in the second data field and configured to indicate when the linked value is marked for deletion from the data structure". However, Bodnar teaches a similar method including "the data structure further comprises a sixth data field containing a deletion indicator corresponding to the value contained in the second data field and configured to indicate when the value is marked for deletion from the data structure" at Col. 39 line 45 to Col. 40 line 10 and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Norris to associate a deletion indicator with each record as taught by Bodnar to indicate whether a record has been deleted, so that

the replica object could be updated accordingly to reflect the changes and maintain the

consistency between the object and the replica object.

As per claim 68, Norris teaches a method as recited in claim 55. Norris does not

teach: "the individual values have a deletion timestamp that is a null identifier to indicate

the existence of a value of the attribute". However, Bodnar teaches a similar method

including "the individual values have a deletion timestamp that is a null identifier to

indicate the existence of a value of the attribute" at Col. 39 line 45 to Col. 40 line 10,

Col. 50 lines 40-67 and Fig. 10B. Thus, it would have been obvious to those of ordinary

skill in the art at the time of the invention to modify Norris to associate a deletion

timestamp with each record as taught by Bodnar to indicate whether a record has been

deleted and the time it has been deleted, so that the replica object could be updated

accordingly to reflect the changes and maintain the consistency between the object and

the replica object.

As per claim 69, Norris teaches the method as recited in claim 55. Norris does

not teach: "the individual values have a deletion timestamp that corresponds to when an

individual value is marked for deletion from the attribute". However, Bodnar teaches a

similar method including "the individual values have a deletion timestamp that

corresponds to when an individual value is marked for deletion from the attribute" at Col.

39 line 45 to Col. 40 line 10, Col. 50 lines 40-67 and Fig. 10B. Thus, it would have been

obvious to those of ordinary skill in the art at the time of the invention to modify Norris to

associate a deletion timestamp with each record as taught by Bodnar to indicate

whether a record has been deleted and the time it has been deleted, so that the replica

object could be updated accordingly to reflect the changes and maintain the consistency between the object and the replica object.

As per claims 70-71, Norris teaches the method as recited in claim 55. Norris does not teaches: "the individual values have a deletion timestamp that corresponds to when an individual value is marked for deletion from the attribute, and the method further comprises deleting a value from the attribute if the value has a deletion timestamp that indicates the value is marked for deletion" However, Bodnar teaches a similar method including "the individual values have a deletion timestamp that corresponds to when an individual value is marked for deletion from the attribute, and the method further comprises deleting a value from the attribute if the value has a deletion timestamp that indicates the value is marked for deletion" at Col. 39 line 45 to Col. 40 line 10, Col. 50 lines 40-67 and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Norris to associate a deletion timestamp with each record as taught by Bodnar to indicate whether a record has been deleted and the time it has been deleted, so that the replica object could be updated accordingly to reflect the changes and maintain the consistency between the object and the replica object.

Response to Arguments

7. Applicant's remark at page 31,with respect to claims 1-86, have been considered but are moot in view of the new ground(s) of rejection.

Norris teaches each and every limitation of claims 1-14, 18-24, 27-36, 39-40, 42-67, and 72-86 as discussed in section 4 above. Norris and Bodnar as combined, teach

the limitations of claims 15-17, 25-26, 37-38, 41, 68-71 as discussed in section 6 above.

Claims 1-86 are therefore rejected.

Conclusion

8. The prior art made of record, listed on form PTO-892, and not relied upon, if any, is

considered pertinent to applicant's disclosure.

If a reference indicated as being mailed on PTO-FORM 892 has not been

enclosed in this action, please contact Lisa Craney whose telephone number is **(703)**

305-9601 for faster service.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Khanh B. Pham whose telephone number is (703) 308-

7299. The examiner can normally be reached on Monday through Friday 7:30am to

4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, John E Breene can be reached on (703) 305-9790. The fax phone number

for the organization where this application or proceeding is assigned is 703-872-9306.

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Khanh B. Pham
Examiner
Art Unit 2177

KBP
July 22, 2004

SRIRAMA CHAMMAMAJIALA
PRIMARY EXAMINER